

1 1. An interferometric strain gage sensor which comprises:
2 a support;
3 a first layer of polymeric material having a first refractive index;
4 a second layer of polymeric material having a second refractive index which
5 second refractive index is distinct from the first refractive index, the sensor having a
6 gage factor of at least 100 and light energy communicates with the sensor, when a
7 strain is applied to the sensor, the light energy is partly absorbed and the change in
8 light energy correlates to the strain applied.

1 2. The sensor of claim 1 which comprises:
2 a plurality of alternating first and second layers.

1 3. The sensor of claim 2 wherein the first layer has a refractive index of
2 approximately 1.6 to 1.7 and is selected from the group consisting of polyimides and
3 polycarbonates.

1 4. The sensor of claim 3 wherein the first layer is polyimide.

1 5. The sensor of claim 2 wherein the second layer has a refractive index of
2 about 1.4 and is selected from the group consisting of polysiloxane, polyethylene,
3 polypropylene, Teflon®, polyvinylidene fluoride and polyester.

1 6. The sensor of claim 5 wherein the second layer is polysiloxane.

1 7. The sensor of claims 4 or 6 wherein the thicknesses of the layers are
2 between about 1 to 20 microns.

1 8. The sensor of claim 1 which comprises:
2 means for contacting the sensor with light energy; and
3 means for measuring changes in the light energy.

1 9. The sensor of claim 1 wherein the sensor is a passive sensor and one of
2 said layers is filled with particulate.

1 10. The sensor of claim 9 wherein there are multiple first and second layers in
2 alternating relationship, the first layer selected from the group consisting of polyimides
3 and polycarbonates, the second layer selected from the group consisting of
4 polysiloxane, polyethylene, polypropylene, Teflon®, polyvinylidene fluoride and
5 polyester.

1 11. The sensor of claim 10 wherein the first layer is polyimide and the
2 second layer is polysiloxane filled with aluminum oxide particulate.

1 12. The sensor of claim 9 which comprises:
2 means for contacting the sensor with light energy; and
3 means for measuring changes in the light energy.

1 13. The sensor of claim 1 wherein the sensor is an active strain gage and
2 comprises a tube-like support for the first and second layers.

1 14. The sensor of claim 13 wherein the first layer has a refractive index of
2 approximately 1.6 to 1.7 and is selected from the group consisting of polyimides and
3 polycarbonates, and wherein the second layer has a refractive index of about 1.4 and is
4 selected from the group consisting of polysiloxane, polyethylene, polypropylene,
5 Teflon®, polyvinylidene fluoride and polyester.

1 15. The sensor of claim 14 wherein the outer most layer is coated with
2 aluminum.

1 16. The sensor of claim 15 which comprises:
2 means for contacting the sensor with light energy; and
3 means for measuring changes in the light energy.